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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/885,163

06/21/2001

Keiji Takahashi

P 281174
56656-US-SuS/sm

3962

909 7590 08/12/2002

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EXAMINER

CUEVAS, PEDRO J

ART UNIT

PAPER NUMBER

2834

DATE MAILED: 08/12/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/885,163

Applicant(s)

TAKAHASHI ET AL.

Examiner

Pedro J. Cuevas

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Specification

1. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.
2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Voltage Regulator Of Vehicle AC Generator Having Switching, Switch Control, Field Control, Power And Power Drive Circuits And Rotation Speed Detection Capability.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,663,631 to Kajiura et al.

Kajiura et al. clearly teaches the construction of a voltage regulator of a vehicle AC generator including a rotor (3) having a field coil (2) and a plurality of magnetic poles (not shown) and a stator (5) having a stator core (not shown) and an armature coil (4), said voltage regulator comprising:

a field current switching circuit (elements 27a-27f) for supplying field current to said field coil in a controlled manner;

a field voltage detecting circuit (11) for detecting field voltage induced in said field coil when said field coil is not supplied with field current; and

a switch control circuit (10), connected to said field voltage detecting circuit, for controlling said switching circuit according to said field voltage; wherein:

said field voltage detecting circuit comprises first means for providing said field voltage induced by residual magnetic flux of said stator core;

said switch control circuit comprises a second means for turning on said switching circuit when one of the frequency and voltage of said field voltage becomes as high as a predetermined value; and

said switch control circuit controls said switching circuit to regulate an output voltage of said AC generator when one of the frequency and voltage of said field voltage becomes as high as a predetermined value.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 5-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,663,631 to Kajiura et al. in view of U.S. Patent No. 5,710,471 to Syverson et al.

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Kajiura et al. disclose the construction of a voltage regulator of a vehicle AC generator as described above.

However, it fails to disclose:

- a power circuit for supplying electric power to said control circuit;

- a power drive circuit for controlling supply of said electric power to said control circuit; and

- first means for detecting rotation speed of said rotor, wherein said first means comprises:

 - a permanent-magnet-rotor that comprises a cylindrical magnet having a plurality of magnetic poles on the peripheral surface thereof, fixed to said rotor and a pickup coil, and third means for providing a binary signal according to rotation speed of said permanent-magnet-rotor;

 - a rectifier connected to said pickup coil for providing DC voltage for controlling said switch element according to said DC voltage;

 - a first set of a permanent-magnet-rotor and a pickup coil and a second set of said field coil and second means for detecting field voltage induced in said field coil by residual magnetic flux of said stator core;

 - third means for providing a first binary signal according to frequency of output voltage of said permanent-magnet-rotor;

 - fourth means for providing a second binary signal according to frequency of said field voltage;

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fifth means for adjusting frequencies of said output voltage and said field voltage; and

an OR circuit connected to said fourth means and said fifth means; and wherein said power drive circuit:

supplies electric power from said power circuit to said control circuit if said rotation speed becomes as high as a predetermined speed;

supplies electric power from said power circuit to said control circuit for a predetermined duration after said field voltage or the output voltage of said pickup coil becomes as high as a predetermined voltage;

supplies said electric power for a predetermined duration initiated by said binary signal;

supplies said electric power for a predetermined duration according to an output signal of said OR circuit; and

further comprises a switch element for supplying electric power from a battery to said power circuit.

Syverson et al. teach the construction of a hybrid alternator with full output at idle comprising:

a power circuit (472) for supplying electric power to said control circuit;

a power drive circuit (594 and 596) for controlling supply of said electric power to said control circuit; and

first means (Figure 13) for detecting rotation speed of said rotor, wherein said first means comprises:

a permanent-magnet-rotor that comprises a cylindrical magnet having a plurality of magnetic poles on the peripheral surface thereof, fixed to said rotor and a pickup coil, and third means for providing a binary signal according to rotation speed of said permanent-magnet-rotor;

a rectifier connected to said pickup coil for providing DC voltage for controlling said switch element according to said DC voltage;

a first set of a permanent-magnet-rotor and a pickup coil and a second set of said field coil and second means for detecting field voltage induced in said field coil by residual magnetic flux of said stator core;

third means (Figure 13) for providing a first binary signal according to frequency of output voltage of said permanent-magnet-rotor;

fourth means (Figure 13) for providing a second binary signal according to frequency of said field voltage;

fifth means (Figure 13) for adjusting frequencies of said output voltage and said field voltage; and

an OR circuit (Figure 13) connected to said fourth means and said fifth means;
and

wherein said power drive circuit:

supplies electric power from said power circuit to said control circuit if said rotation speed becomes as high as a predetermined speed;

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supplies electric power from said power circuit to said control circuit for a predetermined duration after said field voltage or the output voltage of said pickup coil becomes as high as a predetermined voltage;

supplies said electric power for a predetermined duration initiated by said binary signal;

supplies said electric power for a predetermined duration according to an output signal of said OR circuit; and

further comprises a switch element for supplying electric power from a battery to said power circuit

for the purpose of providing a rotor excitation circuit that applies a forward polarity to the wound field portion to increase output in a boosting mode at low RPMs and a reverse polarity to decrease output at high RPMs in a bucking mode to maintain a constant voltage output.

It would have been obvious to one skilled in the art at the time the invention was made to use the hybrid alternator construction disclosed by Syverson et al. on the voltage regulator of a vehicle AC generator disclosed by Kajiura et al. for the purpose of providing a rotor excitation circuit that applies a forward polarity to the wound field portion to increase output in a boosting mode at low RPMs and a reverse polarity to decrease output at high RPMs in a bucking mode to maintain a constant voltage output.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See PTO-892.


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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pedro J. Cuevas whose telephone number is (703) 308-4904. The examiner can normally be reached on M-F from 8:30 - 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor R. Ramirez can be reached on (703) 308-1371. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-1341 for regular communications and (703) 305-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Pedro J. Cuevas
August 8, 2002


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